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(54) Title: ANTIBACTERIAL CLEANING WIPE

(57) Abstract: A cleaning wipe comprising a nonwoven fabric wherein the nonwoven fabric is impregnated with an antibacterial cleaning composition.

WO 03/050225 A1

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ANTIBACTERIAL CLEANING WIPE

Field of Invention

The present invention relates to a nonwoven fabric which has been impregnated
5 with an antibacterial liquid cleaning composition.

Background of the Invention

The patent literature describes numerous wipes for both body cleaning and
cleaning of hard surfaces but none describe the instant cleaning wipes which have
improved cleaning characteristics in the minimization of streaking and residue.

10 U.S. Patent Nos. 5,756,612; 5,763,332; 5,908,707; 5,914,177; 5,980,922 and
6,168,852 teach cleaning compositions which are inverse emulsions.

U.S. Patent Nos. 6,183,315 and 6,183,763 teach cleaning compositions
containing a proton donating agent and having an acidic pH.

U.S. Patent Nos. 5,863,663; 5,952,043; 6,063,746 and 6,121,165 teaches
15 cleaning compositions which are out in water emulsions.

Summary of the Invention

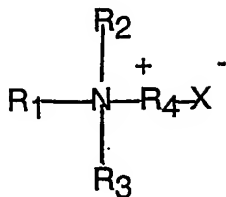
An antibacterial cleaning wipe for cleaning hard surfaces such as walls, counter
tops and floors comprises a nonwoven fabric containing at least polyester fibers and
viscose fibers, wherein the nonwoven fabric is impregnated with a liquid cleaning
20 composition containing at least one nonionic surfactant, a proton donating agent, a
cosurfactant, an alkanol, water and optionally an anionic surfactant and an zwitterionic
surfactant, wherein the liquid cleaning composition is not an emulsion and does not
contain proteins, metallic salts, enzymes, amides, sodium hypochlorite, dimethicone, N-
methyl-2-pyrrolidone, monoalkyl phosphate or silicon based sulfosuccinate.

Detailed Description of the Invention

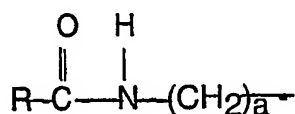
The present invention relates to an antibacterial cleaning wipe for hard surfaces which comprises:

- (a) 20 wt. % to 30 wt. % of a nonwoven fabric which consists of at least
5 polyester fibers and viscose fibers and preferably consists of 60 wt. % to 95 wt. % of wood pulp fibers, 2.5 wt. % to 20 wt. % of viscose fibers and 2.5 wt. % to 20 wt. % of polyester fibers; and
- (b) 70 wt. % to 80 wt. % of a liquid cleaning composition being impregnated in said nonwoven fabric, wherein said liquid cleaning composition comprises:
- 10 (i) 0.5 wt. % to 8 wt. %, more preferably 1.0 wt. % to 6 wt. % of at least one ethoxylated nonionic surfactant;
- (ii) 0.25 wt. % to 10 wt. %, more preferably 0.5 wt. % to 6 wt. % of a C₁-C₄ alkanol;
- (iii) 0.5 wt. % to 8 wt. %, more preferably 1 wt. % to 5 wt. % of a
15 cosurfactant;
- (iv) 0.0 wt. % to 15 wt. %, more preferably 0.25 wt. % to 10 wt. % of an anionic surfactant;
- (v) 0.0 wt. % to 5 wt. % of a zwitterionic surfactant;
- (vi) 0.0 wt. % to 2 wt. % of a disinfecting agent;
- 20 (vii) 0.1 wt. % to 4 wt. %, more preferably 0.2 wt. % to 3 wt. % of a proton donating agent;
- (viii) 0 to 1.0 wt. %, more preferably 0.8 wt. % to 0.1 wt. % of a perfume;
- and
- (ix) the balance being water, wherein the composition has a pH of 3.0
25 to 7, more preferably 3.5 to 5.5.

A water-soluble zwitterionic surfactant (betaine), which may be optionally used in the instant cleaning composition, at a concentration of 0.1% to 5%, preferably 0.25% to 4%, by weight and provides good foaming properties and mildness to the composition. The zwitterionic surfactant is a water soluble betaine having the general formula:



wherein X^- is selected from the group consisting of SO_3^- and CO_2^- and R_1 is an alkyl group having 10 to 20 carbon atoms, preferably 12 to 16 carbon atoms, or the amido radical:



wherein R is an alkyl group having 9 to 19 carbon atoms and a is the integer 1 to 4; R_2 and R_3 are each alkyl groups having 1 to 3 carbons and preferably 1 carbon; R_4 is an alkylene or hydroxyalkylene group having from 1 to 4 carbon atoms and, optionally, one hydroxyl group. Typical alkyldimethyl betaines include decyl dimethyl betaine or 2-(N-decyl-N, N-dimethyl-ammonia) acetate, coco dimethyl betaine or 2-(N-coco N, N-dimethylammonia) acetate, myristyl dimethyl betaine, palmityl dimethyl betaine, lauryl dimethyl betaine, cetyl dimethyl betaine, stearyl dimethyl betaine, etc. The amidobetaines similarly include cocoamidoethylbetaine, cocoamidopropyl betaine and the like. A preferred betaine is coco (C_8 - C_{18}) amidopropyl dimethyl betaine.

As used herein and in the appended claims the term "perfume" is used in its ordinary sense to refer to and include any non-water soluble fragrant substance or mixture of substances including natural (i.e., obtained by extraction of flower, herb, blossom or plant), artificial (i.e., mixture of natural oils or oil constituents) and synthetically produced substance) odoriferous substances. Typically, perfumes are complex mixtures of blends of various organic compounds such as alcohols, aldehydes, ethers, aromatic compounds and varying amounts of essential oils (e.g., terpenes) such as from 0% to 80%, usually from 10% to 70% by weight, the essential oils themselves being volatile odoriferous compounds and also serving to dissolve the other components of the perfume.

In the present invention the precise composition of the perfume is of no particular consequence to cleaning performance so long as it meets the criteria of water immiscibility and having a pleasing odor. Naturally, of course, especially for cleaning compositions intended for use in the home, the perfume, as well as all other ingredients, should be cosmetically acceptable, i.e., non-toxic, hypoallergenic, etc.. The instant compositions show a marked improvement in ecotoxocity as compared to existing commercial products.

The water soluble nonionic surfactants utilized in this invention are commercially well known and include the primary aliphatic alcohol ethoxylates, secondary aliphatic alcohol ethoxylates, alkylphenol ethoxylates and ethylene-oxide-propylene oxide condensates on primary alkanols, such a Plurafacs (BASF) and condensates of ethylene oxide with sorbitan fatty acid esters such as the Tweens (ICI). The nonionic synthetic organic detergents generally are the condensation products of an organic aliphatic or alkyl aromatic hydrophobic compound and hydrophilic ethylene oxide groups. Practically any hydrophobic compound having a carboxy, hydroxy, amido, or amino group with a free hydrogen attached to the nitrogen can be condensed with ethylene oxide or with the polyhydration product thereof, polyethylene glycol, to form a water-soluble nonionic detergent. Further, the length of the polyethenoxy chain can be adjusted to achieve the desired balance between the hydrophobic and hydrophilic elements.

The nonionic detergent class includes the condensation products of a higher alcohol (e.g., an alkanol containing 8 to 18 carbon atoms in a straight or branched chain configuration) condensed with 5 to 30 moles of ethylene oxide, for example, lauryl or myristyl alcohol condensed with 16 moles of ethylene oxide (EO), tridecanol condensed with 6 to moles of EO, myristyl alcohol condensed with 10 moles of EO per mole of myristyl alcohol, the condensation product of EO with a cut of coconut fatty alcohol containing a mixture of fatty alcohols with alkyl chains varying from 10 to 14 carbon atoms in length and wherein the condensate contains either 6 moles of EO per

mole of total alcohol or 9 moles of EO per mole of alcohol and tallow alcohol ethoxylates containing 6 EO to 11 EO per mole of alcohol.

A preferred group of the foregoing nonionic surfactants are the Neodol ethoxylates (Shell Co.), which are higher aliphatic, primary alcohol containing 9-15 carbon atoms, such as C₉-C₁₁ alkanol condensed with 2.5 to 10 moles of ethylene oxide (NEODOL 91-2.5 or -5 or -6 or -8), C₁₂-13 alkanol condensed with 6.5 moles ethylene oxide (Neodol 23-6.5), C₁₂-15 alkanol condensed with 12 moles ethylene oxide (Neodol 25-12), C₁₄-15 alkanol condensed with 13 moles ethylene oxide (Neodol 45-13), and the like.

An especially preferred nonionic system comprises the mixture of a nonionic surfactant formed from a C₉-C₁₁ alkanol condensed with 2 to 3.5 moles of ethylene oxide (C₉-11 alcohol EO 2 to 3.5:1) with a nonionic surfactant formed from a C₉-C₁₁ alkanol condensed with 7 to 9 moles of ethylene oxide (C₉-C₁₁ alcohol EO 7 to 9:1), wherein the weight ratio of the C₉-C₁₁ alcohol EO 7 to 9:1 to the C₉-C₁₁ alcohol EO 2 to 3.5:1 is from 8:1 to 1:1 from preferably 6:1 to 3:1.

Additional satisfactory water soluble alcohol ethylene oxide condensates are the condensation products of a secondary aliphatic alcohol containing 8 to 18 carbon atoms in a straight or branched chain configuration condensed with 5 to 30 moles of ethylene oxide. Examples of commercially available nonionic detergents of the foregoing type are C₁₁-C₁₅ secondary alkanol condensed with either 9 EO (Tergitol 15-S-9) or 12 EO (Tergitol 15-S-12) marketed by Union Carbide.

Other suitable nonionic detergents include the polyethylene oxide condensates of one mole of alkyl phenol containing from 8 to 18 carbon atoms in a straight- or branched chain alkyl group with 5 to 30 moles of ethylene oxide. Specific examples of alkyl phenol ethoxylates include nonyl phenol condensed with 9.5 moles of EO per mole of nonyl phenol, dinonyl phenol condensed with 12 moles of EO per mole of phenol, dinonyl phenol condensed with 15 moles of EO per mole of phenol and diisooctylphenol condensed with 15 moles of EO per mole of phenol. Commercially

available nonionic surfactants of this type include Igepal CO-630 (nonyl phenol ethoxylate) marketed by GAF Corporation.

Also among the satisfactory nonionic detergents are the water-soluble condensation products of a C₈-C₂₀ alkanol with a heteric mixture of ethylene oxide and propylene oxide wherein the weight ratio of ethylene oxide to propylene oxide is from 2.5:1 to 4:1, preferably 2.8:1 to 3.3:1, with the total of the ethylene oxide and propylene oxide (including the terminal ethanol or propanol group) being from 60-85%, preferably 70-80%, by weight. Such detergents are commercially available from BASF-Wyandotte and a particularly preferred detergent is a C₁₀-C₁₆ alkanol condensate with ethylene oxide and propylene oxide, the weight ratio of ethylene oxide to propylene oxide being 3:1 and the total alkoxy content being 75% by weight.

Condensates of 2 to 30 moles of ethylene oxide with sorbitan mono- and tri-C₁₀-C₂₀ alkanolic acid esters having a HLB of 8 to 15 also may be employed as the nonionic detergent ingredient in the described composition. These surfactants are well known and are available from Imperial Chemical Industries under the Tween trade name. Suitable surfactants include polyoxyethylene (4) sorbitan monolaurate, polyoxyethylene (4) sorbitan monostearate, polyoxyethylene (20) sorbitan trioleate and polyoxyethylene (20) sorbitan tristearate.

Other suitable water-soluble nonionic detergents are marketed under the trade name "Plurionics". The compounds are formed by condensing ethylene oxide with a hydrophobic base formed by the condensation of propylene oxide with propylene glycol. The molecular weight of the hydrophobic portion of the molecule is of the order of 950 to 4000 and preferably 200 to 2,500. The addition of polyoxyethylene radicals to the hydrophobic portion tends to increase the solubility of the molecule as a whole so as to make the surfactant water-soluble. The molecular weight of the block polymers varies from 1,000 to 15,000 and the polyethylene oxide content may comprise 20% to 80% by weight. Preferably, these surfactants will be in liquid form and satisfactory surfactants are available as grades L 62 and L 64.

Suitable water-soluble non-soap, anionic surfactants used in the instant compositions include those surface-active or detergent compounds which contain an organic hydrophobic group containing generally 8 to 26 carbon atoms and preferably 10 to 18 carbon atoms in their molecular structure and at least one water-solubilizing group selected from the group of sulfonate, sulfate and carboxylate so as to form a water-soluble detergent. Usually, the hydrophobic group will include or comprise a C₈-C₂₂ alkyl, alkyl or acyl group. Such surfactants are employed in the form of water-soluble salts and the salt-forming cation usually is selected from the group consisting of sodium, potassium, ammonium, magnesium and mono-, di- or tri-C₂-C₃ alkanolammonium, with the sodium, magnesium and ammonium cations again being preferred.

Examples of suitable sulfonated anionic surfactants are the well known higher alkyl mononuclear aromatic sulfonates such as the higher alkyl benzene sulfonates containing from 10 to 16 carbon atoms in the higher alkyl group in a straight or branched chain, C₈-C₁₅ alkyl toluene sulfonates and C₈-C₁₅ alkyl phenol sulfonates.

A preferred sulfonate is linear alkyl benzene sulfonate having a high content of 3- (or higher) phenyl isomers and a correspondingly low content (well below 50%) of 2- (or lower) phenyl isomers, that is, wherein the benzene ring is preferably attached in large part at the 3 or higher (for example, 4, 5, 6 or 7) position of the alkyl group and the content of the isomers in which the benzene ring is attached in the 2 or 1 position is correspondingly low. Particularly preferred materials are set forth in U.S. Patent 3,320,174.

Other suitable anionic surfactants are the olefin sulfonates, including long-chain alkene sulfonates, long-chain hydroxyalkane sulfonates or mixtures of alkene sulfonates and hydroxyalkane sulfonates. These olefin sulfonate detergents may be prepared in a known manner by the reaction of sulfur trioxide (SO₃) with long-chain olefins containing 8 to 25, preferably 12 to 21 carbon atoms and having the formula RCH=CHR₁ where R is a higher alkyl group of 6 to 23 carbons and R₁ is an alkyl group of 1 to 17 carbons or hydrogen to form a mixture of sultones and alkene sulfonic

acids which is then treated to convert the sultones to sulfonates. Preferred olefin sulfonates contain from 14 to 16 carbon atoms in the R alkyl group and are obtained by sulfonating an α -olefin.

Other examples of suitable anionic sulfonate surfactants are the paraffin sulfonates containing 10 to 20, preferably 13 to 17, carbon atoms. Primary paraffin sulfonates are made by reacting long-chain alpha olefins and bisulfites and paraffin sulfonates having the sulfonate group distributed along the paraffin chain are shown in U.S. Patents Nos.. 2,503,280; 2,507,088; 3,260,744; 3,372,188; and German Patent 735,096.

Examples of satisfactory anionic sulfate surfactants are the C₈-C₁₈ alkyl sulfate salts and the C₈-C₁₈ alkyl ether polyethenoxy sulfate salts having the formula $R(OC_2H_4)_n OSO_3M$ wherein n is 1 to 12, preferably 1 to 5, and M is a metal cation selected from the group consisting of sodium, potassium, ammonium, magnesium and mono-, di- and triethanol ammonium ions. The alkyl sulfates may be obtained by sulfating the alcohols obtained by reducing glycerides of coconut oil or tallow or mixtures thereof and neutralizing the resultant product.

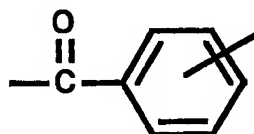
On the other hand, the alkyl ether polyethenoxy sulfates are obtained by sulfating the condensation product of ethylene oxide with a C₈-C₁₈ alkanol and neutralizing the resultant product. The alkyl sulfates may be obtained by sulfating the alcohols obtained by reducing glycerides of coconut oil or tallow or mixtures thereof and neutralizing the resultant product. On the other hand, the alkyl ether polyethenoxy sulfates are obtained by sulfating the condensation product of ethylene oxide with a C₈-C₁₈ alkanol and neutralizing the resultant product. The alkyl ether polyethenoxy sulfates differ from one another in the number of moles of ethylene oxide reacted with one mole of alkanol. Preferred alkyl sulfates and preferred alkyl ether polyethenoxy sulfates contain 10 to 16 carbon atoms in the alkyl group.

The C₈-C₁₂ alkylphenyl ether polyethenoxy sulfates containing from 2 to 6 moles of ethylene oxide in the molecule also are suitable for use in the inventive compositions. These surfactants can be prepared by reacting an alkyl phenol with 2 to

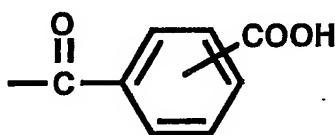
6 moles of ethylene oxide and sulfating and neutralizing the resultant ethoxylated alkylphenol.

Other suitable anionic surfactants are the C₉-C₁₅ alkyl ether polyethenoxy carboxylates having the structural formula R(OC₂H₄)_nOX COOH wherein n is a

5 number from 4 to 12, preferably 5 to 10 and X is selected from the group consisting of CH₂, (C(O)R₁ and



10 wherein R₁ is a C₁-C₃ alkylene group. Preferred compounds include C₉-C₁₁ alkyl ether polyethenoxy (7-9) C(O) CH₂CH₂COOH, C₁₃-C₁₅ alkyl ether polyethenoxy (7-9)



15 and C₁₀-C₁₂ alkyl ether polyethenoxy (5-7) CH₂COOH. These compounds may be prepared by considering ethylene oxide with appropriate alkanol and reacting this reaction product with chloracetic acid to make the ether carboxylic acids as shown in US Pat. No. 3,741,911 or with succinic anhydride or phthalic anhydride. Obviously, these anionic surfactants will be present either in acid form or salt form depending upon the pH of the final composition, with salt forming cation being the same as for the other anionic surfactants.

20 The cosurfactants in the instant compositions are selected from the group consisting of polypropylene glycol of the formula HO(CH₂CHCH₂O)_nH wherein n is a number from 1 to 18, and mono and di C₁-C₆ alkyl ethers and esters of ethylene glycol and propylene glycol having the structural formulas R(X)_nOH, R₁(X)_nOH, R(X)_nOR and R₁(X)_nOR₁ wherein R is C₁-C₆ alkyl group, R₁ is C₂-C₄ acyl group, X is

25 (OCH₂CH₂) or (OCH₂(CH₃)CH) and n is a number from 1 to 4, diethylene glycol, triethylene glycol, an alkyl lactate, wherein the alkyl group has 1 to 6 carbon atoms, 1methoxy-2-propanol, 1methoxy-3-propanol, and 1methoxy 2-, 3- or 4-butanol.

Representative members of the polypropylene glycol include dipropylene glycol and polypropylene glycol having a molecular weight of 150 to 1000, e.g., polypropylene glycol 400. Satisfactory glycol ethers are ethylene glycol monobutyl ether (butyl cellosolve), diethylene glycol monobutyl ether (butyl carbitol), triethylene glycol monobutyl ether, mono, di, tri propylene glycol monobutyl ether, tetraethylene glycol monobutyl ether, mono, di, tripropylene glycol monomethyl ether, propylene glycol monomethyl ether, ethylene glycol monohexyl ether, diethylene glycol monohexyl ether, propylene glycol tertiary butyl ether, ethylene glycol monoethyl ether, ethylene glycol monomethyl ether, ethylene glycol monopropyl ether, ethylene glycol monopentyl ether, diethylene glycol monomethyl ether, diethylene glycol monoethyl ether, diethylene glycol monopropyl ether, diethylene glycol monopentyl ether, triethylene glycol monomethyl ether, triethylene glycol monoethyl ether, triethylene glycol monopropyl ether, triethylene glycol monopentyl ether, triethylene glycol monohexyl ether, mono, di, tripropylene glycol monoethyl ether, mono, di tripropylene glycol monopropyl ether, mono, di, tripropylene glycol monopentyl ether, mono, di, tripropylene glycol monohexyl ether, mono, di, tributylene glycol mono methyl ether, mono, di, tributylene glycol monoethyl ether, mono, di, tributylene glycol monopropyl ether, mono, di, tributylene glycol monobutyl ether, mono, di, tributylene glycol monopentyl ether and mono, di, tributylene glycol monohexyl ether, ethylene glycol monoacetate and dipropylene glycol propionate. While all of the aforementioned glycol ether compounds provide the described stability, the most preferred cosurfactant is propylene glycol N-butyl ether.

A proton donating agent is used in the instant composition at a concentration of 0.1 wt. % to 4 wt. %, preferably 0.2 wt. % to 3 wt. % is selected from the group consisting of organic acids and inorganic acids and mixtures thereof. The organic acids are selected from the group consisting of mono- and di-aliphatic carboxylic acids and hydroxy containing organic acids and mixtures thereof. Typical organic acids are adipic acid, succinic acid, lactic acid, glycolic acid, salicylic acid, tartaric acid and ortho

hydroxy benzoic acid. Typical inorganic acids are sulfuric acid, nitric acid and hydrochloric acid.

The preferred C₁-C₄ alkanols are ethanol or isopropanol and mixtures thereof.

A disinfectant agent can optionally be used in the instant composition at a
5 concentration of 0 to 2 wt. %, more preferably 0.1 wt. % to 1.4 wt. % and is selected from the group consisting of C₈-C₁₆ alkyl amines, C₈-C₁₆ alkyl benzyl dimethyl ammonium chlorides, C₈-C₁₆ dialkyl dimethyl ammonium chlorides, C₈-C₁₆ alkyl, C₈-C₁₄ alkyl dimethyl ammonium chloride and chlorhexidine and mixtures thereof.

Some typical disinfectant agent useful in the instant compositions are a triclosan,
10 preservative such as formalin, essential oil, perfume, tetra alkyl or trialkyl benzyl ammonium salts which are manufactured by Lonza, S.A. They are: Bardac 2180 (or 2170) which is N-decyl-N-isononyl-N, N-dimethyl ammonium chloride; Bardac 22 which is didecyl dimethyl ammonium chloride; Bardac LF which is N,Ndioctyl-N, N-dimethyl ammonium chloride; Bardac 114 which is a mixture in a ratio of 1:1:1 of N-didecyl-N, N-dimethyl ammonium chloride/N-alkyl-N-ethyl phenylmethyl-N, N-dimethyl-N-ethyl
15 ammonium chloride; and Barquat MB-50 which is N-alkyl-N, N-dimethyl-N-benzyl ammonium chloride. The final essential ingredient in the instant composition is water. The proportion of water in the compositions generally is in the range of 70 wt. % to 98.5 wt. %.

20 The cleaning composition of this invention may, if desired, also contain other components either to provide additional effect or to make the product more attractive to the consumer. The following are mentioned by way of example: Colors or dyes in amounts up to 0.5% by weight; preservatives with a specific activity spectrum such as iodo propynyl butyl carbamate, 5-bromo-5-nitro-dioxan-1,3; 5-chloro-2-methyl-4-
25 isothaliazolin-3-one, etc., in amounts up to 0.5% by weight ; antioxidizing agents such as 2,6-di-ter.butyl-p-cresol in amounts up to 0.5% by weight ; and pH adjusting agents, such as citric acid, sulfuric acid or sodium hydroxide, mono-, di- and tri-alkanol amines as needed.

The cleaning compositions are prepared by simple batch mixing at 25°C-30°C. The nonwoven fabric is impregnated with the liquid cleaning composition by means of a positive impregnation process. The liquid is positively fed into the nonwoven fabric through a controlled gear pump and injection bar at a ratio of 2.5-3.0 grams of liquid
5 cleaning composition to 1 gram of the nonwoven fabric.

The nonwoven fabric is formed from 10 wt. % to 90 wt. % of viscose fibers and 10 wt. % to 90 wt. % of polyester fibers such as Spunlace made by the Dexter Corporation. More preferably the nonwoven fabric comprises 10 wt. % to 95 wt. % of wood pulp fibers, 1 wt. % to 40 wt. % of viscose fibers and 1 wt. % to 40 wt. % of
10 polyester fibers. Such a nonwoven fabric which is manufactured by Dexter Corporation under the name Hydraspun comprises 60% to 95% of wood pulp fabrics, 2.5 wt. % to 20 wt. % of viscose fibers and 2.5 wt. % to 20 wt. % of polyester fibers.

The following examples illustrate liquid cleaning compositions of the described invention. The exemplified compositions are illustrative only and do not limit the scope
15 of the invention. Unless otherwise specified, the proportions in the examples and elsewhere in the specification are by weight.

Example 1

The following cleaning wipes were made by the aforementioned process.

20

	A	B
Part I	Wt. %	Wt. %
Propylene glycol N-butyl ether	3.0	3.0
Ethanol	1.0	1.0
Cocoamido propyl dimethyl betaine	3.0	3.0
C9-C11 alcohol EO7.5-8:1 nonionic	2.0	2.0
Perfume	0.6	0.6
C9-C11 alcohol EO2.5:1 nonionic	0.37	0.37
Bardac 2170	0.72	0.72
Water	Bal.	Bal.
Part II		
Part I	73.68	73.68
Spunlace	26.32	
Hydraspun 8579		26.32
pH	6.5	6.5

Example 2

The following cleaning wipe was made by the aforementioned process.

	C
Part I	Wt. %
Propylene glycol N-butyl ether	3.0
Ethanol	1.0
Lactic acid	0.75
C9-C11 alcohol EO7.5-8:1 nonionic	2.0
Perfume	0.6
Paraffin sulfonate surfactant	2.0
C9-C11 EO2.5:1	0.37
Triethanol amine	0.36
Water	
Part II	
Part I	
Hydraspun	
pH	3.5

- 5 Formulas A, B and C were tested for cleaning performance on Perspex tiles and rated on a 10 point scale (0 = very poor/much residue and 10 = very good/no residue).

	<u>A</u>	<u>B</u>	<u>C</u>
Residue score	1.7	3.4	4.7

- 10 15cm x 15 cm Perspex black tiles are wiped with the impregnated test substrate in a circular movement such that the middle of the tile is wet and contours kept dry.

Each test product is applied on 5 different tiles (= 5 replicates), then 5 judges score the residue pattern (observation made under indirect light conditions) of each tile from 0= very poor residue score up to 10= excellent, no residue on a 10 point scale.

- 15 Results are then analyzed statistically.

What Is Claimed:

1. A cleaning wipe which comprises:
 - (a) 20 wt. % to 30 wt. % of a nonwoven fabric; and
 - (b) 70 wt. % to 80 wt. % of a liquid cleaning composition being impregnated
- 5 in said nonwoven fabric, wherein said liquid cleaning composition comprises:
 - (i) 0.5 wt. % to 8 wt. % of at least one ethoxylated nonionic surfactant;
 - (ii) 0.5 wt. % to 10 wt. % of a C₁-C₄ alkanol;
 - (iii) 0.5 wt. % to 8 wt. % of a cosurfactant;
 - (iv) 0.0 wt % to 15% wt. % of an anionic surfactant;
 - 10 (v) 0.1 wt. % to 4 wt. % of a proton donating agent; and
 - (vi) the balance being water, wherein the composition has a pH of 3.5 to 5.5.
2. The cleaning wipe of Claim 1, wherein said anionic surfactant is a paraffin sulfonate.
- 15 3. The cleaning wipe of Claim 2, wherein said C₁-C₄ alkanol is ethanol or isopropanol.
4. The cleaning wipe of Claim 3, wherein said cosurfactant is a glycol ether.
5. The cleaning wipe of Claim 2, wherein said glycol ether is propylene glycol N-butyl ether.
- 20 6. The cleaning wipe of Claim 1, wherein said cosurfactant is glycol ether.
7. The cleaning wipe of Claim 6, wherein said glycol ether is propylene glycol N-butyl ether.
8. The cleaning wipe of Claim 4 further including a perfume.
9. The cleaning wipe of Claim 1, further including a zwitterionic surfactant.
- 25 10. The cleaning wipes of Claim 9 wherein said zwitterionic surfactant is a cocoamidopropyl dimethyl betaine.
11. The cleaning wipes of Claim 10, further including a disinfecting agent.
12. The cleaning wipes of Claim 11 wherein said disinfecting agent is a tetraalkyl ammonium salt or a trialkyl benzyl ammonium salt.

13. The cleaning wipe of Claim 1, wherein said proton donating agent is an organic acid or inorganic acid.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/02/37560

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 C11D17/04 A47L13/17 C11D1/72 C11D1/86 C11D1/94
 C11D3/43 //C11D1:72,C11D1:62,C11D1:90,C11D1:14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C11D A47L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 1 097 987 A (PROCTER & GAMBLE) 9 May 2001 (2001-05-09) paragraphs '0022!-'0026!', '0039!', '0044!', '0057!', '0065!', '0066!', '0111!', '0112!', '0117!', '0124! paragraph '0125!; examples A,D, paragraph '0126!; examples E,H ---	1-13
Y	US 6 121 224 A (DORMAL DIDIER ET AL) 19 September 2000 (2000-09-19) column 2, line 44-62 column 7, line 17-34 column 9, line 43-46 example 1 --- -/--	1-13

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 02/37560

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 448 704 A (BARBY DONALD ET AL) 15 May 1984 (1984-05-15) column 3, line 6-12; table 1 column 4, line 13-54 column 5, line 40-44 examples 13,20-22	1-13
A	WO 00 61105 A (PROCTER & GAMBLE) 19 October 2000 (2000-10-19) examples	1-13
A	WO 89 05114 A (RECKITT & COLMANN PROD LTD) 15 June 1989 (1989-06-15) page 3, line 7-25 page 4, line 10-14 examples; table IV	1-13
A	WO 99 41068 A (DOTOLO RES CORP) 19 August 1999 (1999-08-19) page 3, line 14 -page 4, line 13 example I	1-13
P,A	EP 1 167 510 A (PROCTER & GAMBLE) 2 January 2002 (2002-01-02) paragraphs '0038!', '0112! examples A-D	1-13
P,A	WO 02 50241 A (UNILEVER) 27 June 2002 (2002-06-27) page 5, line 6-16 page 8, line 4-11 page 13, line 20,21 examples	1-13

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inter Application No

PCT/US 02/37560

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1097987	A	09-05-2001	EP 1097987 A1	09-05-2001
			AU 1358601 A	14-05-2001
			BR 0015301 A	09-07-2002
			EP 1228191 A1	07-08-2002
			WO 0132826 A1	10-05-2001
US 6121224	A	19-09-2000	US 5911915 A	15-06-1999
			AU 1815099 A	05-07-1999
			WO 9931216 A1	24-06-1999
			US 6323171 B1	27-11-2001
US 4448704	A	15-05-1984	AT 17132 T	15-01-1986
			AU 553065 B2	03-07-1986
			AU 8424382 A	02-12-1982
			BR 8203134 A	17-05-1983
			CA 1182373 A1	12-02-1985
			DE 3268092 D1	06-02-1986
			DK 244182 A	30-11-1982
			EP 0067016 A1	15-12-1982
			ES 8307475 A1	01-11-1983
			GR 76824 A1	04-09-1984
			JP 1803269 C	26-11-1993
			JP 5007015 B	27-01-1993
			JP 57203423 A	13-12-1982
			NO 821792 A ,B,	30-11-1982
			NZ 200784 A	13-09-1985
			PH 18989 A	29-11-1985
			PT 74972 A ,B	01-06-1982
			ZA 8203707 A	28-12-1983
WO 0061105	A	19-10-2000	AU 4344400 A	14-11-2000
			CN 1346263 T	24-04-2002
			EP 1176947 A1	06-02-2002
			JP 2002541181 T	03-12-2002
			WO 0061105 A1	19-10-2000
			US 6413529 B1	02-07-2002
WO 8905114	A	15-06-1989	FR 2623993 A1	09-06-1989
			AT 79005 T	15-08-1992
			AU 612274 B2	04-07-1991
			AU 3730089 A	05-07-1989
			BR 8807764 A	16-10-1990
			DE 3873546 D1	10-09-1992
			DE 3873546 T2	11-02-1993
			DK 127690 A	23-05-1990
			WO 8905114 A1	15-06-1989
			EP 0398891 A1	28-11-1990
			ES 2009425 A6	16-09-1989
			JP 3503125 T	18-07-1991
			NO 902391 A	30-05-1990
			NZ 227187 A	21-12-1990
			PT 89136 A ,B	29-12-1989
			ZA 8808776 A	30-08-1989
WO 9941068	A	19-08-1999	US 6015763 A	18-01-2000
			AU 1937299 A	30-08-1999
			WO 9941068 A1	19-08-1999

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US 02/37560

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1167510	A	02-01-2002	EP 1167510 A1	02-01-2002
			AU 7133501 A	08-01-2002
			WO 0200084 A2	03-01-2002
			US 2002031966 A1	14-03-2002
WO 0250241	A	27-06-2002	AU 3849302 A	01-07-2002
			WO 0250241 A2	27-06-2002

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